What is claimed is:

1. A valve for controlling the flow of fluid bi-directionally between an upstream supply and a downstream location, comprising:

a valve body including a valve seat through which fluid may flow in both directions between the upstream supply and the downstream location, the valve body defining:

a first chamber upstream of the valve seat;

a second chamber in fluid communication with the first chamber; and

a fluid flow path connecting the first chamber with the upstream supply, the fluid flow path having a predetermined upstream flow restriction;

a valve assembly mounted in the valve body and moveable between a closed position and an open position, the valve assembly including a valve element with an enlarged portion positioned downstream of the valve seat that is adapted to engage the valve seat when the valve assembly is in the closed position, the valve assembly in communication with the fluid pressure within the first chamber, the second chamber, the downstream location and the upstream location such that the forces exerted upon the valve assembly by the fluid pressure bias the valve assembly to the open position when the fluid flows from the downstream location to the upstream supply.

2. The valve of claim 1, further comprising a spring positioned in the valve body to bias the valve assembly toward the open position.

3. The valve of claim 1, wherein the valve body includes a cross-drilled orifice forming the predetermined upstream flow restriction and connecting the first chamber with the upstream supply.

4. The valve of claim 1, wherein the valve element includes a fluid communication passage connecting the first chamber with the second chamber.

5. The valve of claim 4, wherein the fluid communication passage comprises a cross-drilled orifice in communication with a longitudinal bore.

6. The valve of claim 1, wherein the valve body includes a lower projection receiving the valve seat and the cross-drilled orifices, the valve body also including an upwardly opening cavity with an upper threaded portion, the valve further comprising a pole at an upper portion having a spring receiving cavity, an externally threaded retainer engaging the upper threaded portion of the valve body and a shim in the spring receiving cavity of the pole, wherein the valve element has a radially enlarged lower end adapted to engage the valve seat in the closed position and a threaded portion at an upper end, wherein the valve assembly further includes an annular spacer, an armature, a sleeve and a threaded nut, wherein the valve element extends through the annular spacer, the armature, the sleeve and the threaded nut, respectively, and wherein the threaded portion of the valve element engages the threaded nut and extends into the spring receiving cavity of the pole, and wherein the pole extends into the upwardly opening cavity of the valve body.

7. The valve of claim 1, wherein the valve body includes a fluid communication passage extending from a lower surface of the valve body to an upwardly opening cavity.

8. The valve of claim 1, wherein the valve assembly further includes a spacer with an annular cavity on a lower surface which is in fluid communication with the upstream supply.

9. The valve of claim 1, wherein the valve assembly further includes a spacer, an armature, a sleeve and a nut threadably engaging an upper threaded portion of the valve element and retaining the spacer, armature and sleeve on the valve element, wherein the valve includes a pole positioned within the valve body and receiving the valve assembly in a spring receiving cavity, wherein the outer diameter of the sleeve is smaller than the diameter of the spring receiving cavity.

10. The valve of claim 1, wherein the valve assembly further includes a spacer, an armature, a sleeve and a nut threadably engaging an upper threaded portion of the valve element and retaining the spacer, armature and sleeve on the valve element, wherein the valve includes a pole positioned within the valve body and receiving the valve assembly in a spring receiving cavity, wherein the outer diameter of the sleeve is substantially the same diameter as the spring receiving cavity.

11. A valve for controlling the flow of fluid bi-directionally between an upstream supply and a downstream location, comprising:

a valve body including a valve seat through which fluid may flow in both directions between the upstream supply and the downstream location, the valve body defining:

a first chamber upstream of the valve seat;

a second chamber in fluid communication with the first chamber; and

a fluid flow path connecting the first chamber with the upstream supply, the fluid flow path having a cross-drilled orifice forming a predetermined upstream flow restriction and connecting the first chamber with the upstream supply;

a valve assembly mounted in the valve body and moveable between a closed position and an open position, the valve assembly including a valve element with an enlarged portion positioned downstream of the valve seat that is adapted to engage the valve seat when the valve assembly is in the closed position and a spacer with an annular cavity on a lower surface which is in fluid communication with the upstream supply, the valve assembly in communication with the fluid pressure within the first chamber, the second chamber, the downstream location and the upstream location such that the forces exerted upon the valve assembly by the fluid pressure bias the valve assembly to the open position when the fluid flows from the downstream location to the upstream supply.

12. The valve of claim 11, further comprising a spring positioned in the valve body to bias the valve assembly toward the open position.

13. The valve of claim 11, wherein the valve element includes a fluid communication passage connecting the first chamber with the second chamber.

14. The valve of claim 13, wherein the fluid communication passage comprises a cross-drilled orifice in communication with a longitudinal bore.

15. The valve of claim 11, wherein the valve body includes a lower projection receiving the valve seat and the cross-drilled orifices, the valve body also including an upwardly opening cavity with an upper threaded portion, the valve further comprising

a pole at an upper portion having a spring receiving cavity, an externally threaded retainer engaging the upper threaded portion of the valve body and a shim in the spring receiving cavity of the pole, wherein the valve element has a radially enlarged lower end adapted to engage the valve seat in the closed position and a threaded portion at an upper end, wherein the valve assembly further includes an annular spacer, an armature, a sleeve and a threaded nut, wherein the valve element extends through the annular spacer, the armature, the sleeve and the threaded nut, respectively, and wherein the threaded portion of the valve element engages the threaded nut and extends into the spring receiving cavity of the pole, and wherein the pole extends into the upwardly opening cavity of the valve body.

16. The valve of claim 11, wherein the valve body includes a fluid communication passage extending from a lower surface of the valve body to an upwardly opening cavity.

17. The valve of claim 11, wherein the valve assembly further includes a spacer with an annular cavity on a lower surface which is in fluid communication with the upstream supply.

18. The valve of claim 11, wherein the valve assembly further includes a spacer, an armature, a sleeve and a nut threadably engaging an upper threaded portion of the valve element and retaining the spacer, armature and sleeve on the valve element, wherein the valve includes a pole positioned within the valve body and receiving the valve assembly in a spring receiving cavity, wherein the outer diameter of the sleeve is smaller than the diameter of the spring receiving cavity.

19. The valve of claim 11, wherein the valve assembly further includes a spacer, an armature, a sleeve and a nut threadably engaging an upper threaded portion of the valve element and retaining the spacer, armature and sleeve on the valve element, wherein the valve includes a pole positioned within the valve body and receiving the valve assembly in a spring receiving cavity, wherein the outer diameter of the sleeve is substantially the same diameter as the spring receiving cavity.

20. A valve for controlling the flow of fluid bi-directionally between an upstream supply and a downstream location, comprising:

a valve body including a valve seat through which fluid may flow in both directions between the upstream supply and the downstream location, the valve body defining:

a first chamber upstream of the valve seat;

a second chamber in fluid communication with the first chamber; and

a fluid flow path connecting the first chamber with the upstream supply, the fluid flow path having a predetermined upstream flow restriction;

a valve assembly mounted in the valve body and moveable between a closed position and an open position, the valve assembly including a valve element with an enlarged portion positioned downstream of the valve seat that is adapted to engage the valve seat when the valve assembly is in the closed position, the valve assembly in communication with the fluid pressure within the first chamber, the second chamber, the downstream location and the upstream location such that the forces exerted upon the valve assembly by the fluid pressure bias the valve assembly to the open position when the fluid flows from the downstream location to the upstream supply.

21. The valve of claim 20, further comprising a spring positioned in the valve body to bias the valve assembly toward the open position.

Sub A1

22. The valve of claim 20, wherein the valve body includes a cross-drilled orifice forming the predetermined upstream flow restriction and connecting the first chamber with the upstream supply.

23. The valve of claim 20, wherein the valve element includes a fluid communication passage connecting the first chamber with the second chamber.

24. The valve of claim 20, wherein the fluid communication passage comprises a cross-drilled orifice in communication with a longitudinal bore.

25. The valve of claim 20, wherein the valve body includes a lower projection receiving the valve seat and the cross-drilled orifices, the valve body also including an upwardly opening cavity with an upper threaded portion, the valve further comprising a pole at an upper portion having a spring receiving cavity, an externally threaded retainer engaging the upper threaded portion of the valve body and a shim in the spring receiving cavity of the pole, wherein the valve element has a radially enlarged lower end adapted to engage the valve seat in the closed position and a threaded portion at an upper end, wherein the valve assembly further includes an annular spacer, an armature, a sleeve and a threaded nut, wherein the valve element extends through the annular spacer, the armature, the sleeve and the threaded nut, respectively, and wherein the threaded portion of the valve element engages the threaded nut and extends into the spring receiving cavity of the pole, and wherein the pole extends into the upwardly opening cavity of the valve body.

26. The valve of claim 20, wherein the valve body includes a fluid communication passage extending from a lower surface of the valve body to an upwardly opening cavity.

27. The valve of claim 20, wherein the valve assembly further includes an armature, a sleeve and a nut threadably engaging an upper threaded portion of the valve element and retaining the spacer, armature and sleeve on the valve element, wherein the valve includes a pole positioned within the valve body and receiving the valve assembly in a spring receiving cavity, wherein the outer diameter of the sleeve is smaller than the diameter of the spring receiving cavity.

28. The valve of claim 20, wherein the valve assembly further includes an armature, a sleeve and a nut threadably engaging an upper threaded portion of the valve element and retaining the spacer, armature and sleeve on the valve element, wherein the valve includes a pole positioned within the valve body and receiving the valve assembly in a spring receiving cavity, wherein the outer diameter of the sleeve is substantially the same diameter as the spring receiving cavity.